

Claims

1. A method of determining a bit rate in a first communication device, the first  
5 communication device comprising a protocol stack for transferring information  
to a second communication device, the protocol stack comprising a protocol  
layer, the protocol layer providing a logical channel for transferring first  
information through said protocol layer, in which method:

10 the first information is transferred through the protocol layer via said logical  
channel, **characterized** in that:

the bit rate in said logical channel is determined on the basis of second  
information obtainable from said protocol layer.

2. A method according to claim 1, **characterized** in that:

15 said second information is selected from the protocol layer, the second  
information indicating how much first information is transferred through the  
protocol layer via said logical channel during a given first period of time; and

the bit rate during the first period of time in the logical channel is determined  
on the basis of said second information selected from the protocol layer.

20 3. A method according to claim 1, **characterized** in that the bit rate is determined  
on the basis of said second information, the second information being control  
information by which the flow of information in said logical channel is  
controlled.

25 4. A method according to claim 1, **characterized** in that the bit rate is determined  
on the basis of second information that is separate with respect to the first  
information to be transferred to said second communication device, the second  
information being control information arranged to control the operation of said  
30 protocol layer.

5. A method according to claim 1, **characterized** in that a transport format is used to control the first information that flows in the logical channel, and the bit rate is determined on the basis of the transport format in use in said logical channel.
- 5 6. A method according to claim 1, **characterized** in that said protocol stack is a WCDMA (Wideband Code Division Multiple Access) protocol stack and that the first communication device communicates with said second communication device using the WCDMA protocol stack.
- 10 7. A method according to claim 1, **characterized** in that the protocol layer through which the first information is transferred via said logical channel is the MAC (Medium Access Control) Layer of the WCDMA protocol stack.
- 15 8. A method according to claim 1, **characterized** in that said first communication device is a wireless terminal of a cellular communication network and the second communication device is a network element of a cellular communication network.
- 20 9. A method according to claim 1, **characterized** in that said first communication device is a network element of a cellular communication network and said second communication device is a wireless terminal of a cellular communication network.
- 25 10. A method according to claim 5, **characterized** in that said transport format comprises parameters TBS (Transmission Block Size) and TTI (Transmission Time Interval), and the bit rate in a given logical channel is determined on the basis of the values of said parameters.
- 30 11. A method according to claim 1, **characterized** in that more than one logical channel passes through said protocol layer and each of said more than one logical channel is identified by a logical channel identifier.

12.A method according to claims 10 and 11, **characterized** in that the bit rate during a first period of time in a logical channel identified by a logical channel identifier is determined on the basis of parameters TBS and TTI, wherein the value of the parameter TBS determines the amount of data that can be transmitted during a period of time defined by parameter TTI.

13.A method according to claim 12, **characterized** in that the value of parameter TTI determines the length of said first period of time.

14.A method according to claim 6, **characterized** in that said second information, on the basis of which the bit rate is determined, is taken from the MAC Layer of the WCDMA protocol stack in response to the transfer of a data block coming from the RLC Layer of the WCDMA protocol stack from a logical channel of the MAC Layer to a transport channel of the Physical Layer of the WCDMA protocol stack in connection with transmission of the data block.

15.A method according to claims 12 and 14, **characterized** in that said second information, on the basis of which the bit rate is determined, is taken from said protocol layer only once during said first period of time.

16.A method according to claim 12, **characterized** in that the bit rate in said logical channel is determined by means of a mathematical calculation in which the value of parameter TBS is divided by the value of parameter TTI.

17.A method according to claim 12, **characterized** in that the bit rate value in the logical channel is determined repeatedly.

18.A method according to claim 17, **characterized** in that said repeatedly determined bit rate value is maintained and updated in a memory available for use by the first communication device.

19.A method according to claim 17, **characterized** in that an average bit rate in said logical channel is calculated.

20.A method according to claim 19, **characterized** in that said average is calculated as a running average.

5 21.A method according to claim 19 or 20, **characterized** in that said average is maintained and updated in a memory available for use by the first communication device.

10 22.A method according to claim 1, **characterized** in that the value of the determined bit rate is provided to an application in the first communication device.

15 23.A method according to claim 22, **characterized** in that said bit rate value provided to an application is used to optimize an information flow produced by the application.

24.A method according to claim 1, **characterized** in that the determined bit rate is provided for another protocol layer in the first communication device.

20 25.A method according to claim 24, **characterized** in that said bit rate value provided to another protocol layer is used to optimize an information flow transmitted by said other protocol layer.

25 26.A method according to claim 1, **characterized** in that more than one logical channel passes through said protocol layer and that a PDP (Packet Data Protocol) context uses more than one logical channel for transmitting said first information to said second communication device, in which method:

30 the total bit rate of the PDP context in a given direction (UL/DL) during said period of time is determined by adding the bit rate values of the logical channels in use by the PDP context in said direction.

27.A method of determining a bit rate in a first communication device, the first communication device comprising a protocol stack for receiving information

from a second communication device, the protocol stack comprising a protocol layer, the protocol layer providing a logical channel for transferring first information through said protocol layer, in which method:

the first information is transferred through the protocol layer via said logical channel, **characterized** in that:

the bit rate in said logical channel is determined on the basis of second information obtainable from said protocol layer.

28. A method according to claim 27, **characterized** in that said first communication device comprises a WCDMA protocol stack and that said second information, on the basis of which the bit rate is determined, is taken from the MAC Layer of the WCDMA protocol stack.

29. A first communication device (60) comprising a protocol stack for transferring information to a second communication device, the protocol stack comprising a protocol layer (103), the protocol layer being arranged to provide a logical channel (141 - 144) for transferring first information through said protocol layer, the first communication device comprising:

a processing element (CPU) for transferring the first information through the protocol layer (103) via said logical channel, **characterized** in that the first communication device further comprises:

a processing element (CPU, 208) for determining the bit rate in the logical channel (141 - 144) on the basis of second information obtainable from said protocol layer.

30. A first communication device according to claim 29, **characterized** in that it comprises:

a processing element (CPU) for selecting said second information from the protocol layer, the second information indicating how much first information is transferred through the protocol layer via said logical channel during a first period of time; and

a processing element (CPU, 208) for determining the bit rate in the logical channel during the first period of time on the basis of said second information selected from the protocol layer.

- 5 31. A first communication device according to claim 29, **characterized** in that it comprises a processing element (CPU, 208) for determining the bit rate value in the logical channel repeatedly.
- 10 32. A first communication device according to claim 31, **characterized** in that it comprises a database (209) and said repeatedly determined bit rate value is maintained and updated in a memory available for use by the first communication device.
- 15 33. A first communication device according to claim 29, **characterized** in that it comprises a processing element (CPU, 208, 209) for calculating an average of the bit rate in the logical channel.
- 20 34. A first communication device according to claim 33, **characterized** in that it comprises a processing element (CPU, 208, 209) for calculating said average as a running average.
35. A first communication device according to claim 33, **characterized** in that it comprises a database (209) for maintaining and updating said average.
- 25 36. A first communication device (60) comprising a protocol stack for receiving information from a second communication device, the protocol stack comprising a protocol layer (103), the protocol layer being arranged to provide a logical channel (141 - 144) for transferring first information through said protocol layer, the first communication device comprising:
  - 30 a processing element (CPU) for transferring the first information through the protocol layer (103) via said logical channel, **characterized** in that the first communication device further comprises:

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